

Truck Scheduling for Ground to Air Connectivity: Final Report

**Randolph W. Hall
California PATH Research Report
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Two-page Summary**

Why Was This Research Undertaken?

This research was undertaken in order to provide a detailed assessment of the challenges in integrating an automated highway with urban/suburban street systems and to identify strategies to overcome the integration challenges.

What Was Done?

Three primary tasks were completed: (1) strategic modeling, which investigated effects of entrance/exit spacing and highway orientation; (2) operational simulation modeling of entrance and exit operations; and (3) case study analysis of entrance exit designs within the context of existing highways. The strategic modeling was analytical in nature to highlight effects of automated highway construction on surface traffic as a function of design features. The simulation modeling entailed simulation of random events and modeled alternate strategies for grouping vehicles into platoons. The case study analysis included site visits, photographic documentation, and creation of alternate designs.

What Can Be Concluded From the Research?

Automated highways would have the positive effect of reducing travel on streets, especially on streets running parallel to the highway. However, the benefits would be greatest if a large number of lower-capacity automated highways are constructed, rather than a few with very high capacity.

Entrance/exit strategies can be characterized by platoon assignment and lane assignment rules. By providing more entrance lanes to sort incoming traffic, vehicles can be assigned to platoons having a narrow range of destinations, which increases distance traveled within platoons and increases highway capacity.

Major considerations associated with construction of entrances and exits include: (1) available space, (2) surrounding land uses, (3) existing highway structural design, and (4) surface street capacity. These factors can be mitigated by carefully selecting locations for highway access egress and designing entrances and exits that connect to multiple streets, rather than pushing all traffic through a single congested road.

What Do the Researchers Recommend?

Prior to investing in automated highway construction, the California Department of Transportation should invest in the creation of an access/egress strategy. This strategy should be used to identify feasible sites for automated highway construction, optimize locations and designs for access/egress, and to determine where automated highway construction is viable.

Implementation Strategies.

The research can be implemented within the context of automated highway deployment planning. A State deployment plan should specifically address access and egress, including strategic design, operational design, and physical interface design, as covered in the final report. The models and procedures in the final report provide guidance for all three elements.

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